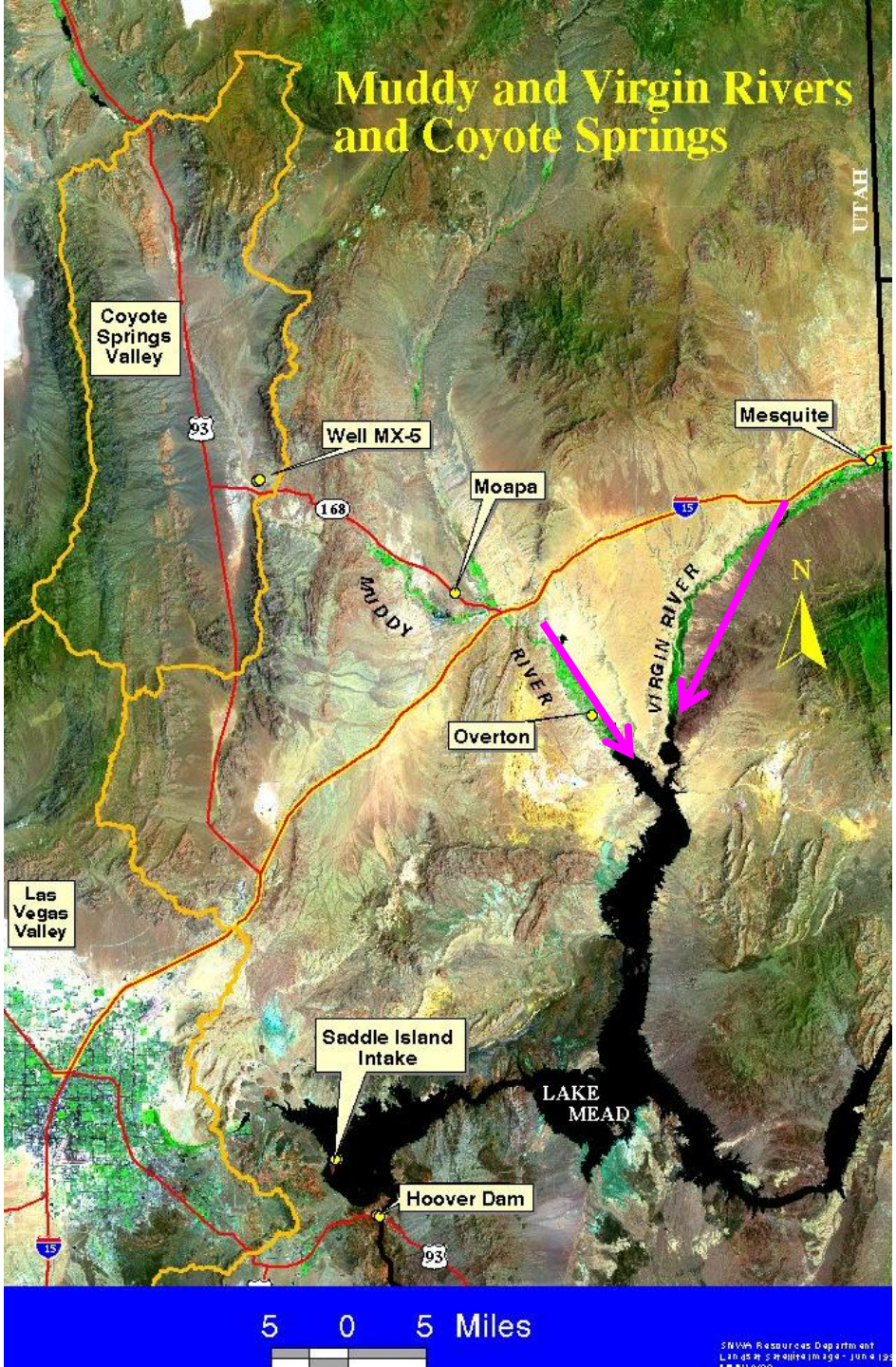
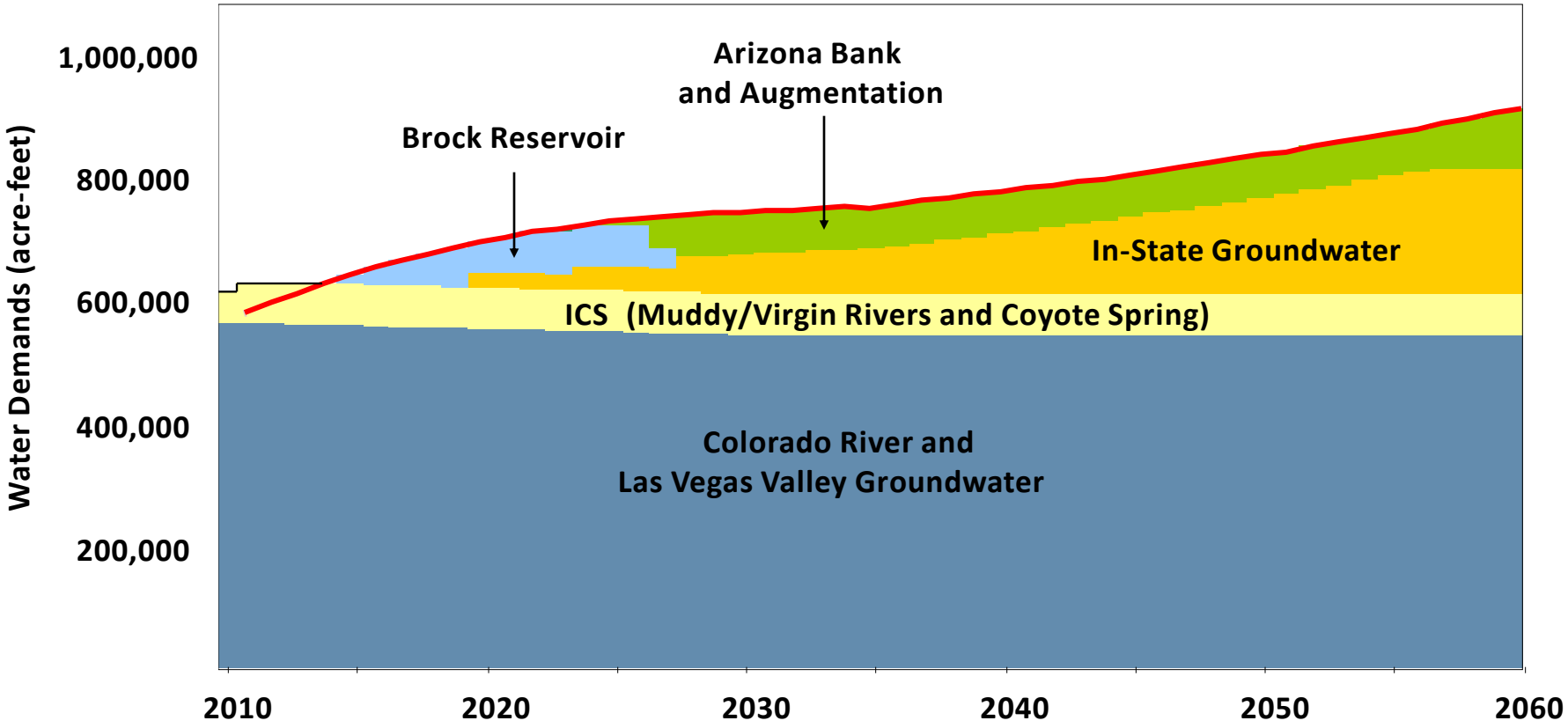
Coyote Spring Valley
Development of Existing Rights

Well MX-5


Muddy and Virgin Rivers
and Coyote Springs
UTAH
Coyote Springs Valley
93
Well MX-5
168
Moapa
Mesquite
15
MUDDY RIVER
VIRGIN RIVER
N
Overton
Las Vegas Valley
Saddle Island Intake
LAKE MEAD
Hoover Dam
93
15
5 0 5 Miles

SNWA Water Resource Plan

SNWA Water Resource Plan, which provides a comprehensive overview of water resources and demand in Southern Nevada.



Diversification:
Intentionally Created Surplus

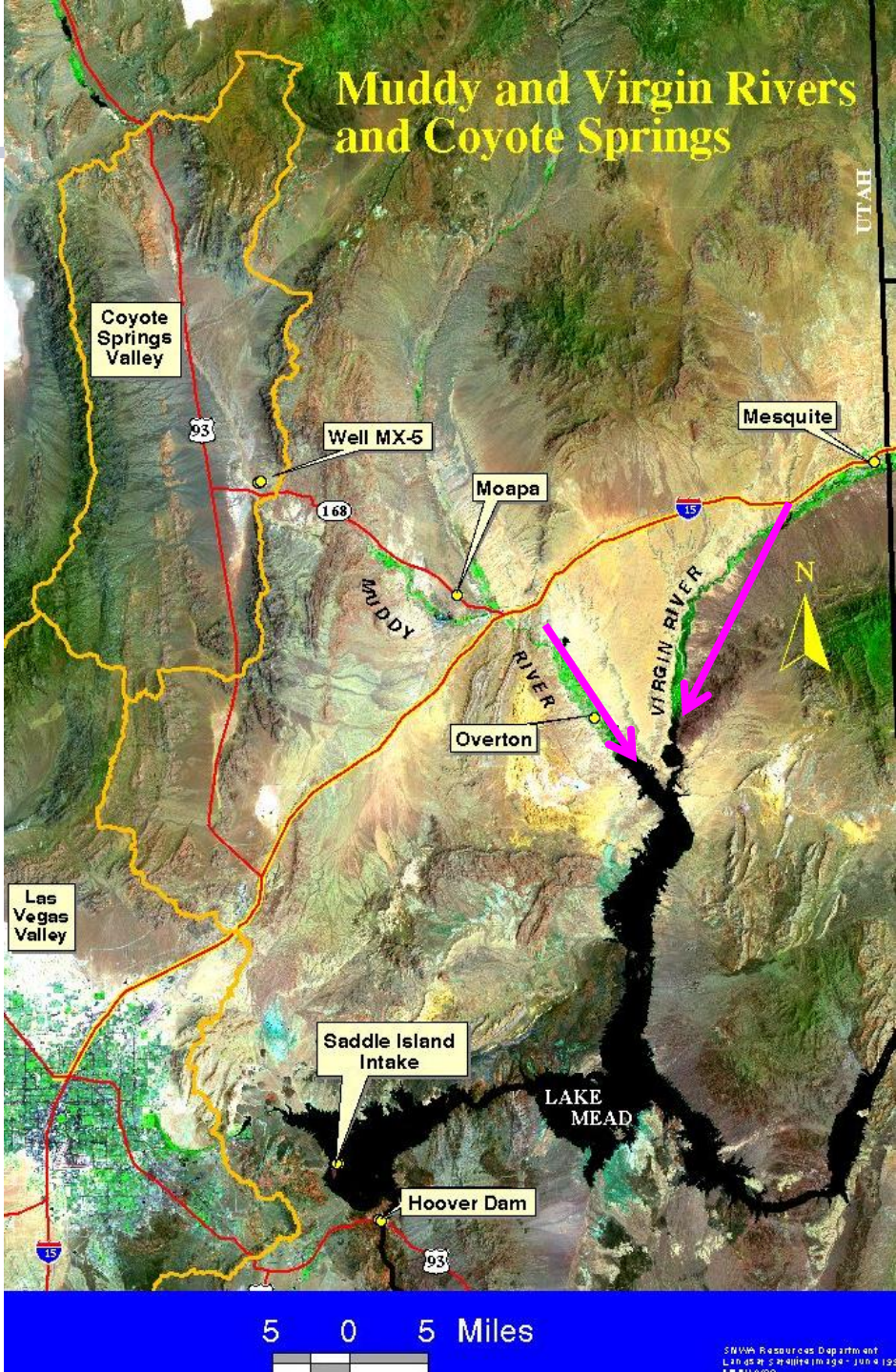
First Importation of water since Colorado River water

Tributary Conservation:

- Muddy and Virgin Rivers
- Acquisition and retirement of pre-1929 agricultural rights
- Conveyance of water to Lake Mead for Colorado River credits

Imported Groundwater:

- Coyote Spring Valley
- Facilities convey groundwater to Lake Mead for Colorado River credits
- Began in 2010



History

1997 – NSE Permits a total of 16,100 afy

priority date of 1983 - 1986

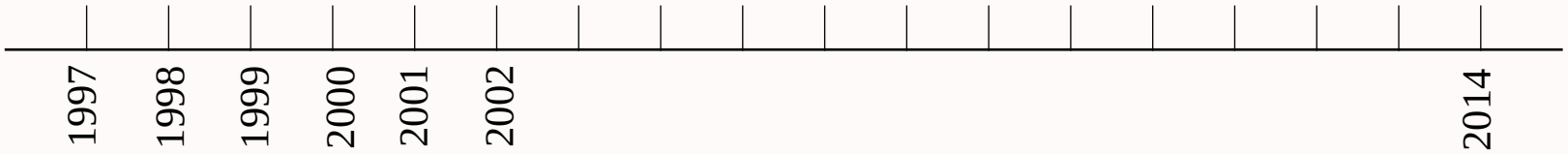
1998 – SNWA purchases 7,500 afy

1998 – CSI files for additional water rights

2000 – Pre-hearing conference

2001 – Hearings

2002 – Order 1169



Order 1169

- Existing Water Rights

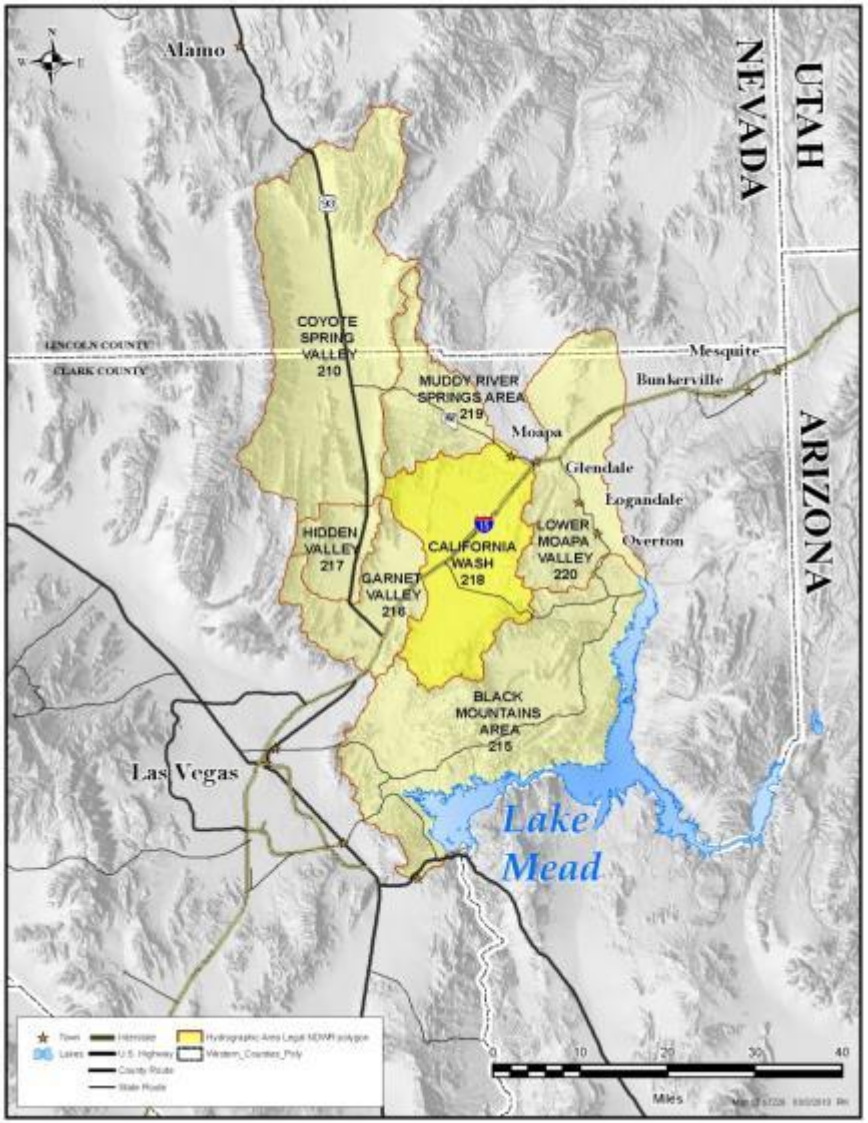
  9,000 afy SNWA

  4,600 afy CSI LLC

  2,500 afy NV Energy

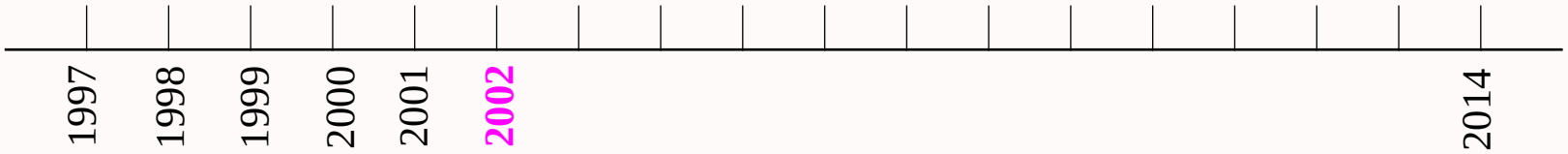
  16,100 afy

- NDWR Order 1169 (March 2002)
  - Holds in abeyance applications
  - 5-year study with 50% of existing rights pumped for 2 consecutive years
  - Compile data and submit to NDWR for evaluation



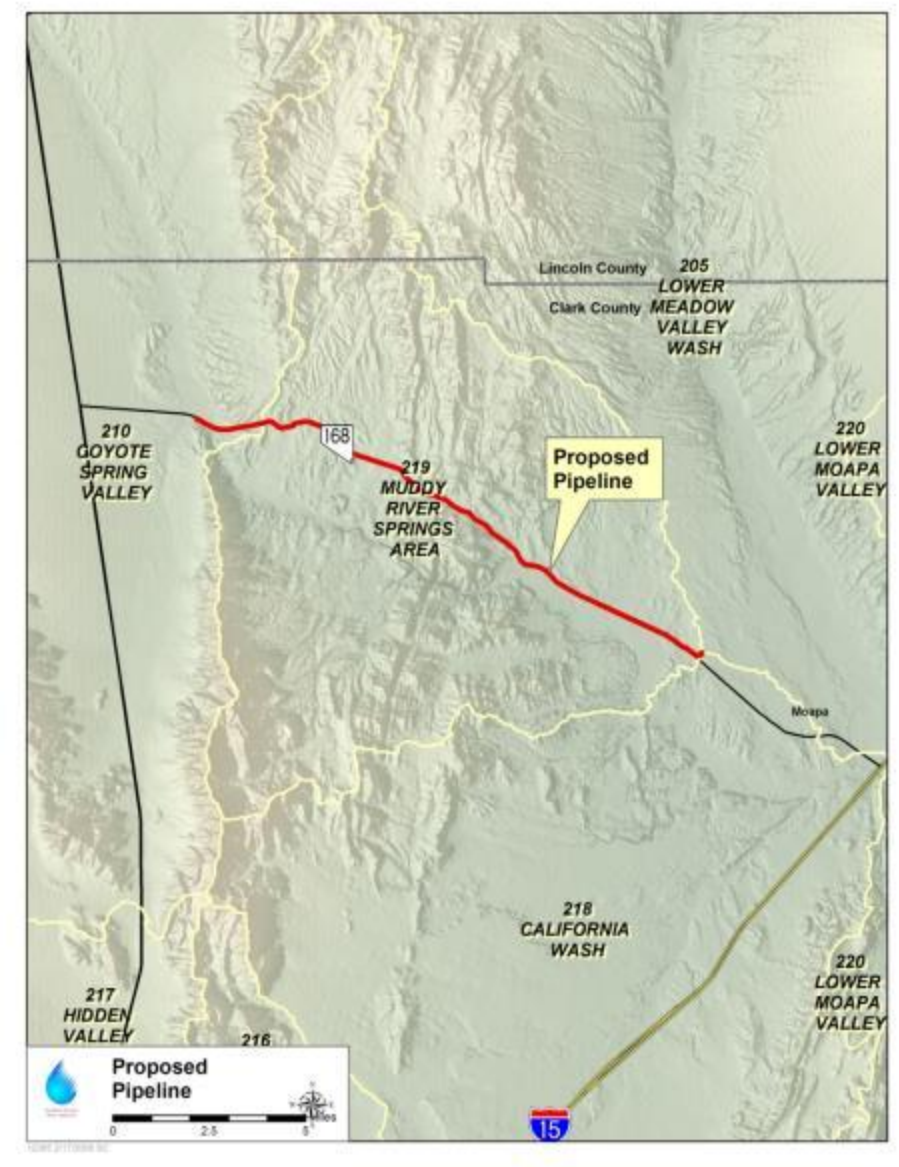
History

2002 – Resource sharing agreement w/ MVWD and CSI



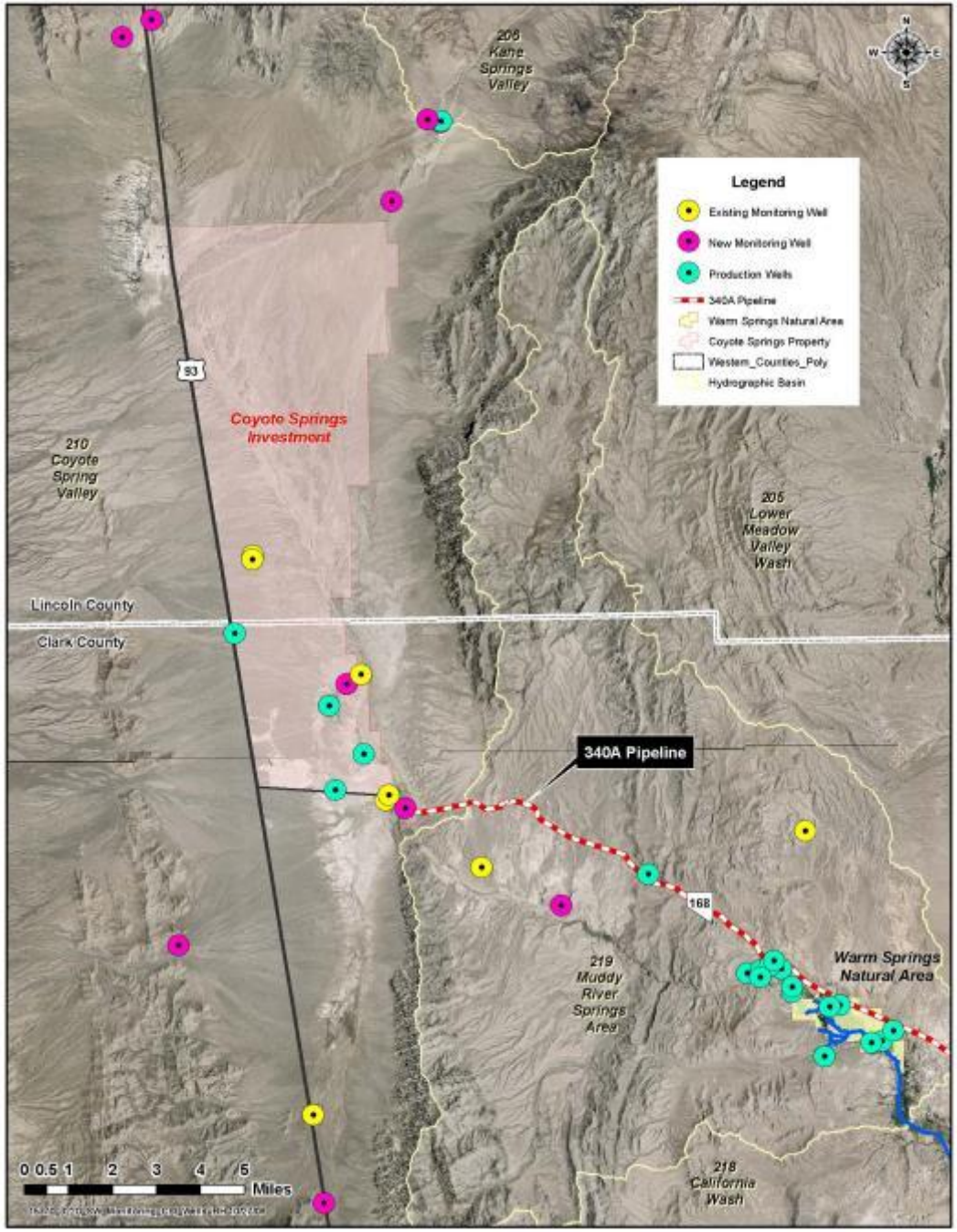
SNWA Groundwater Development

- Proposed Pipeline
  - Convey Existing SNWA Rights
  - Facilitate 1169 Testing
- Extensive Monitoring
- Right-of-Way
  - NEPA and ESA requirements

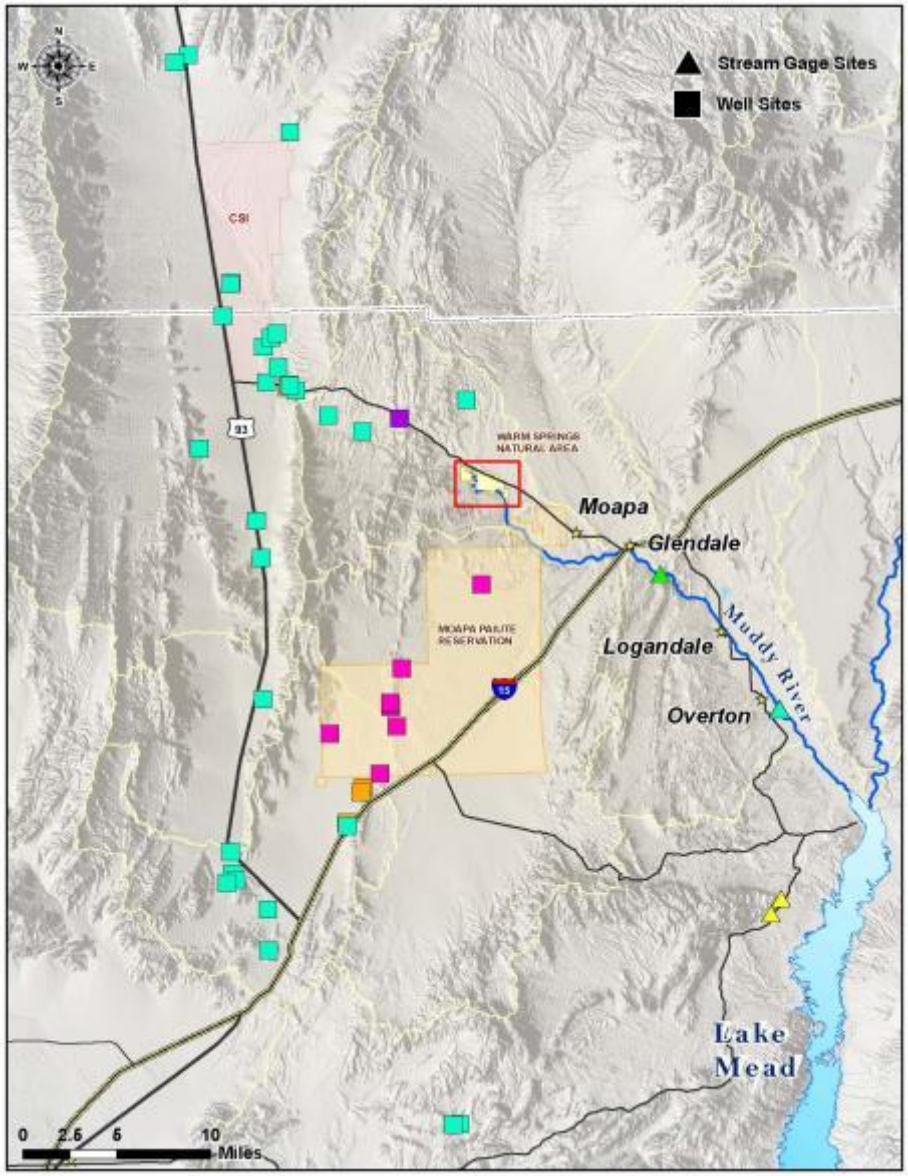


Monitoring

- Existing Monitor Wells
- 2002 / 03 Additional Monitor Wells
- Existing and New (CSI) Production Wells

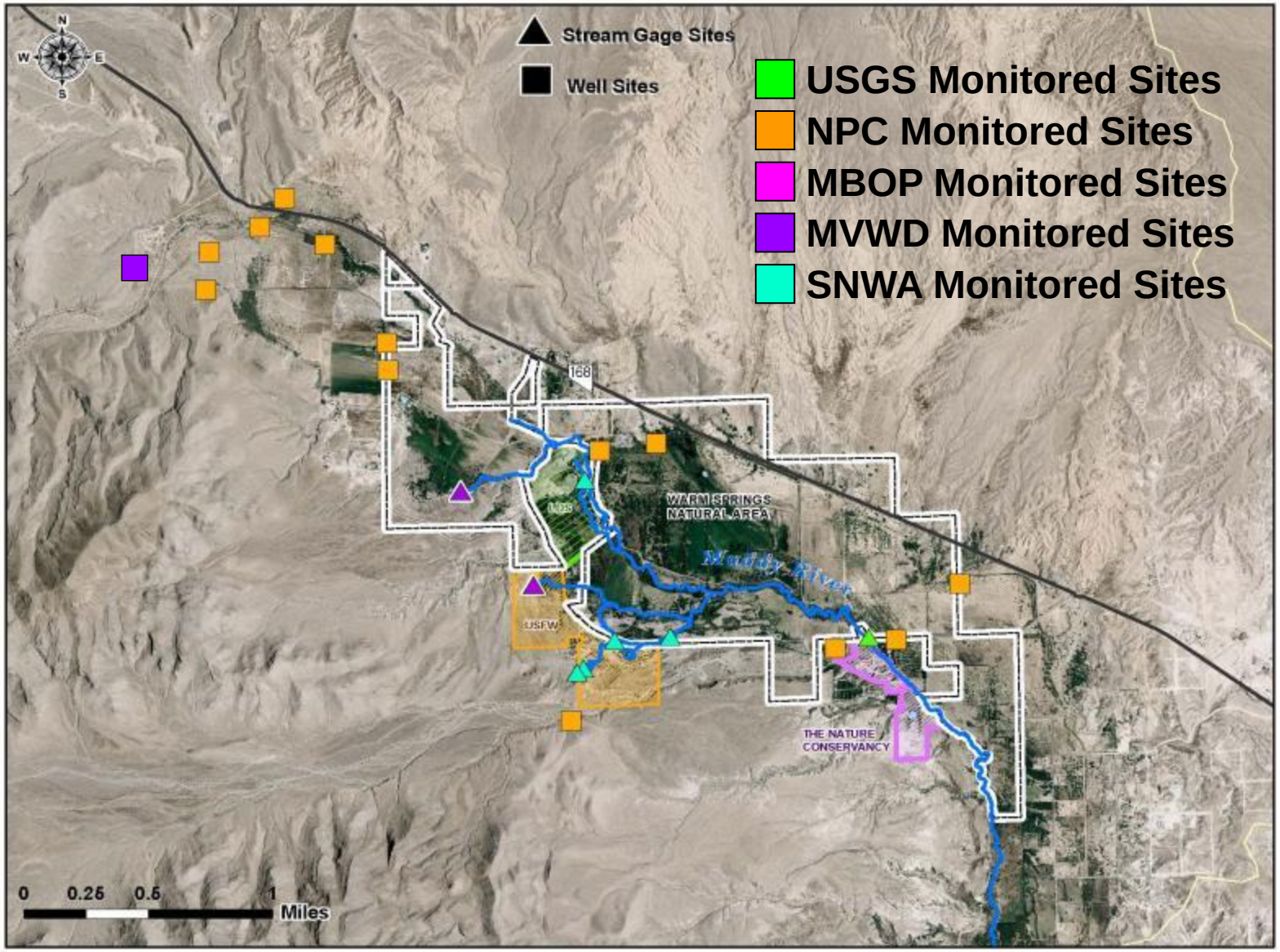


Regional Monitoring



- USGS Monitored Sites
- NPC Monitored Sites
- MBOP Monitored Sites
- MVWD Monitored Sites
- NPS Monitored Sites
- SNWA Monitored Sites

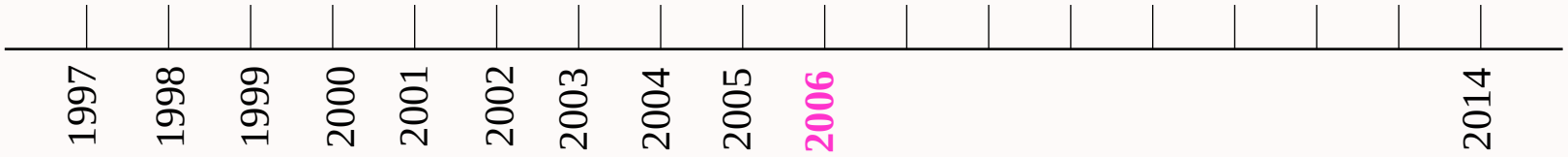
Muddy River Springs Area Monitoring



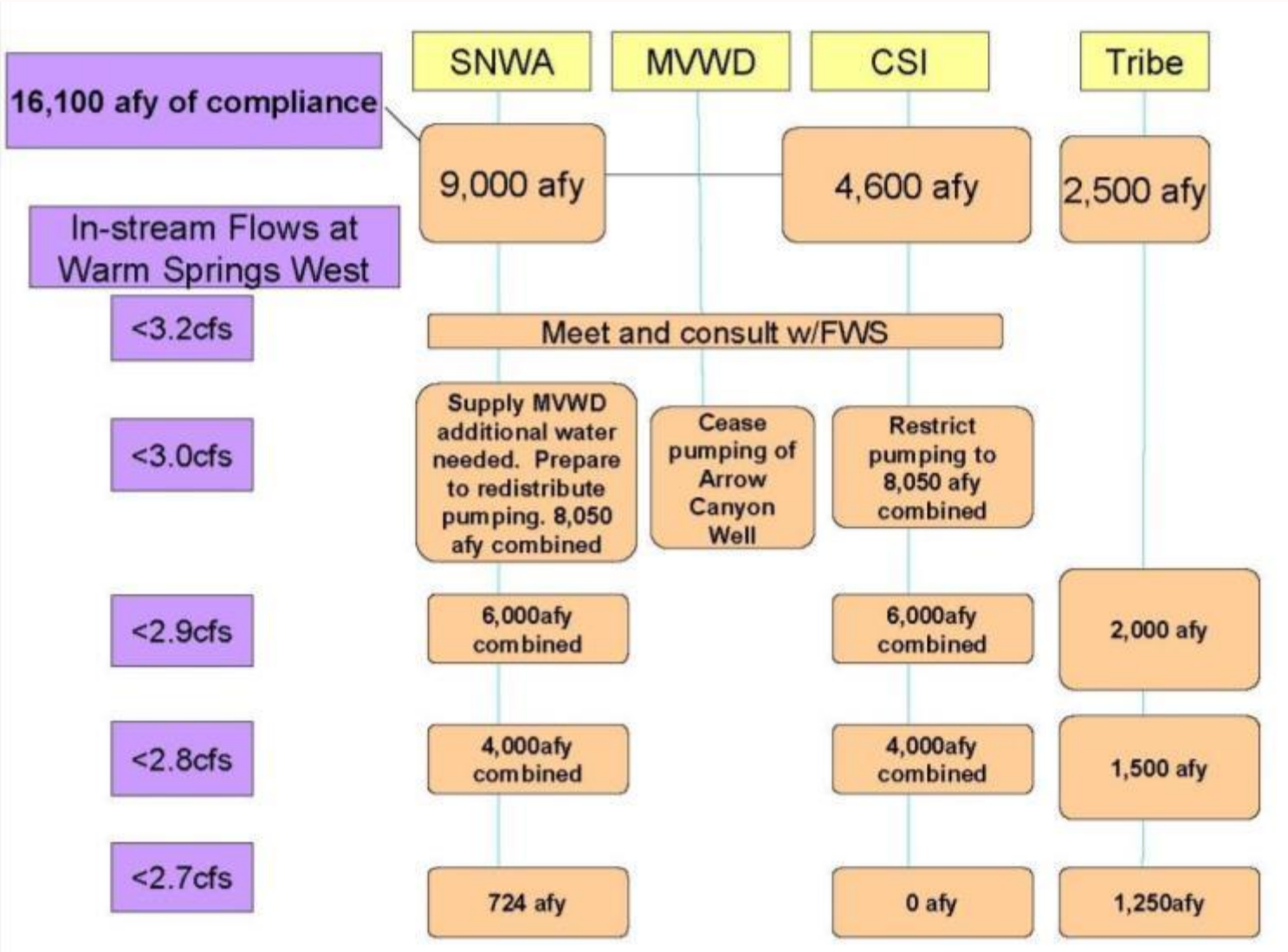
Memorandum of Agreement

April 2006, SNWA entered into a Memorandum of Agreement with U.S. Fish and Wildlife Service, CSI, and MVWD.

- **Dedication of MVWD's Jones Spring water right (1 cfs) as a pass through flow to allow for augmentation of habitat**
- **Trigger flow levels to ensure protection of Moapa Dace**
- **Dedication of 10% of CSI's existing rights to Moapa Dace recovery**
- **Established a Recovery Implementation Program**
- **Established a Hydrologic Review Team**



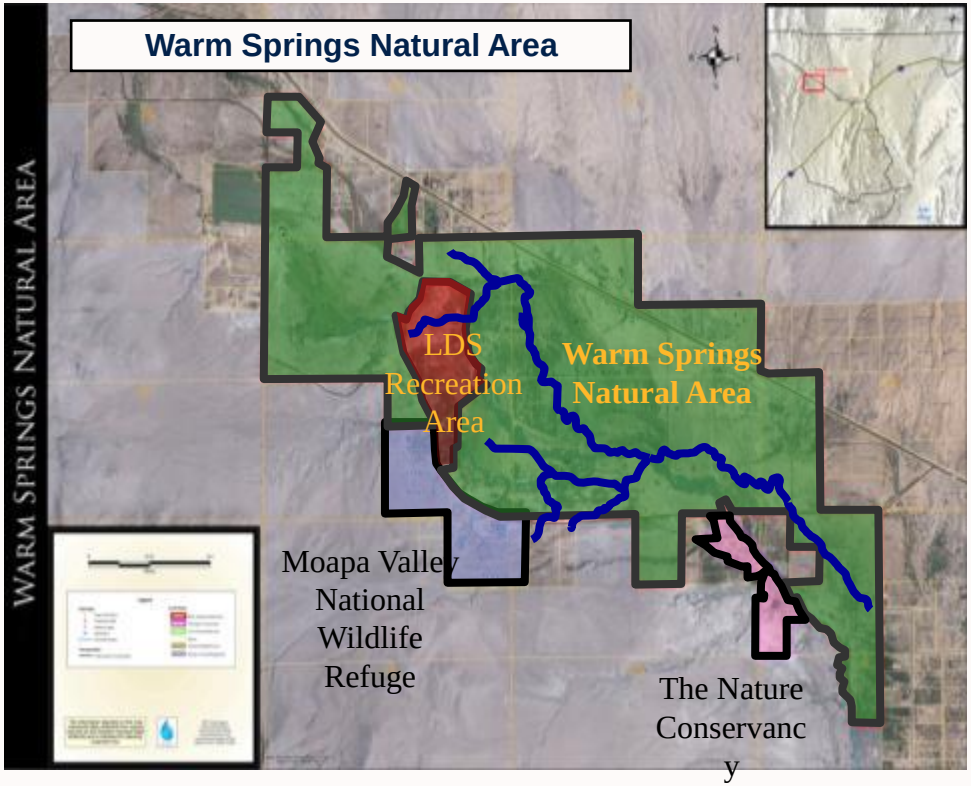
Memorandum of Agreement Triggers



Warm Spring Natural Area

2007 SNWA acquires the Warm Springs Natural with SNPLMA funding for

- **1,220 acres**
- **Historical habitat of Moapa Dace**
- **Environmental Conservation**

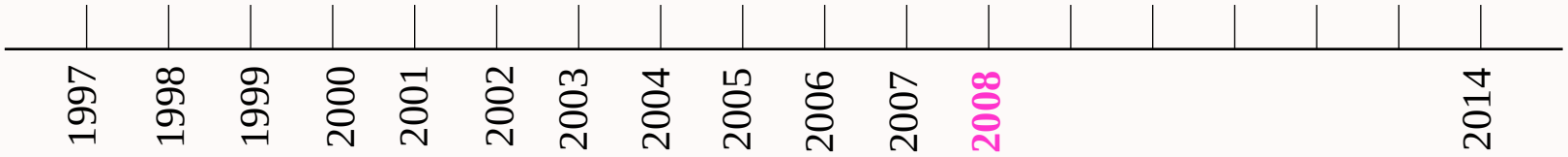


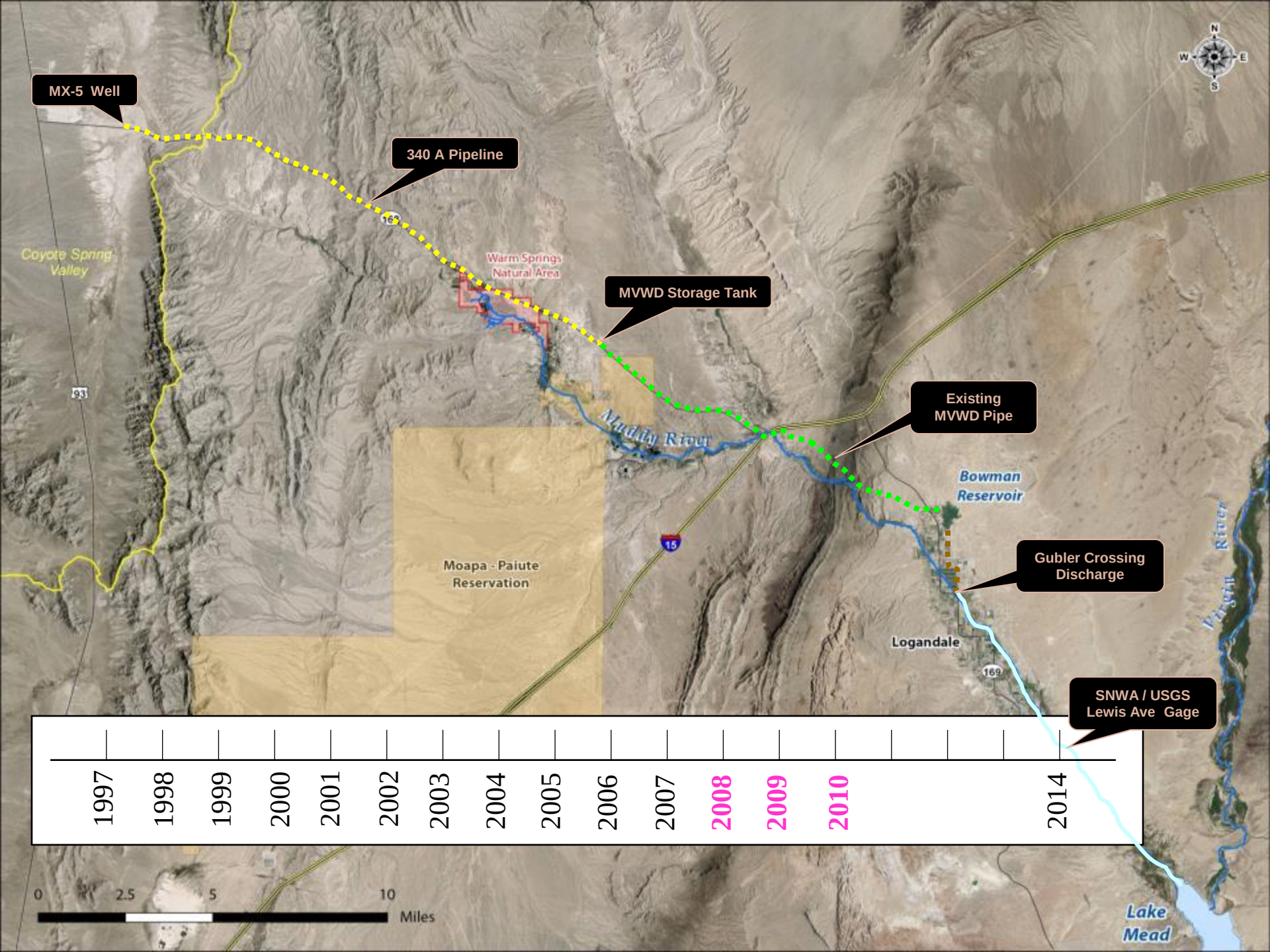
1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 **2007** 2014

SNWA, MVWD Agreement

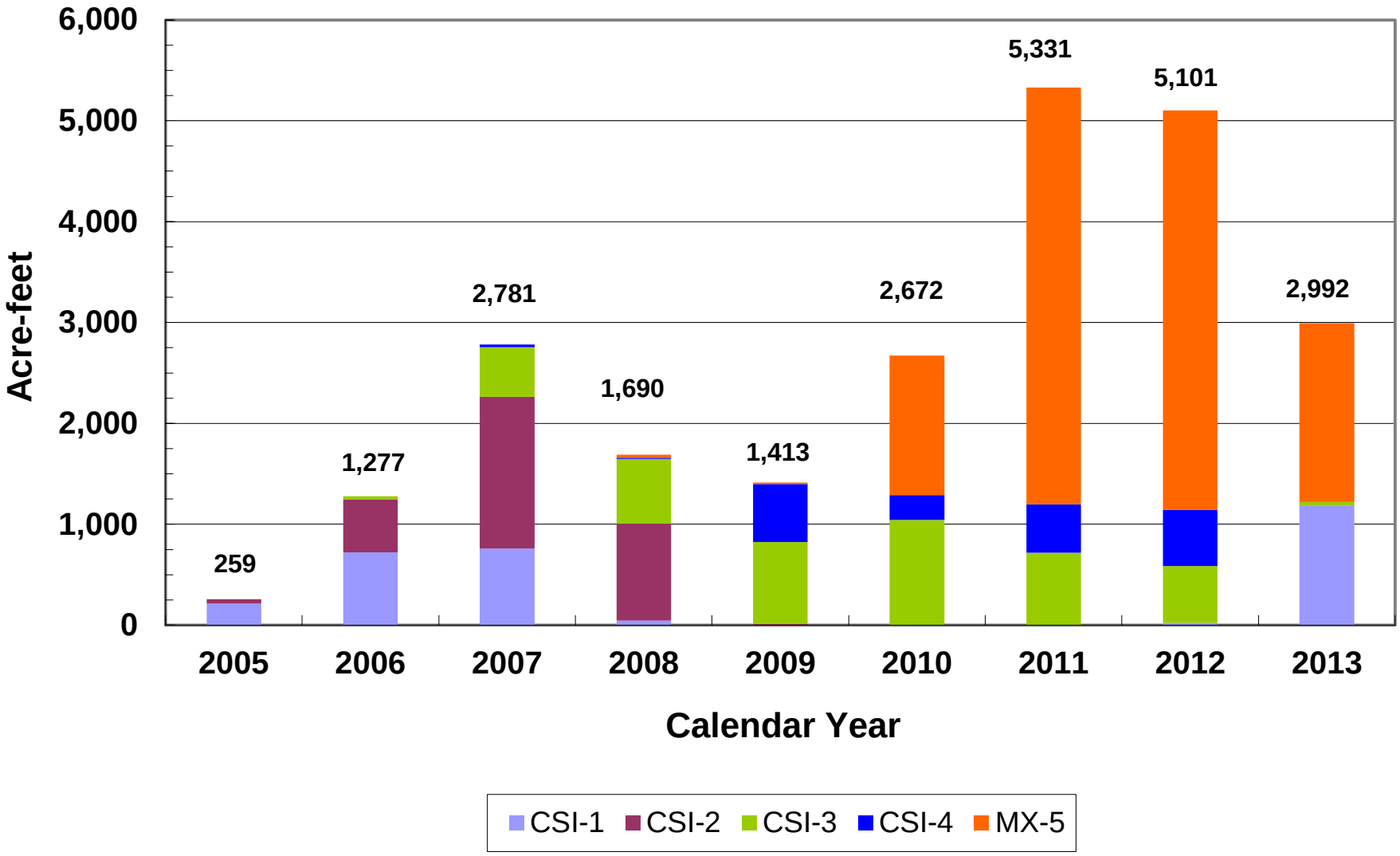
2008 Agreement to maximize and exchange rights

- **MVWD ability to acquire and use SNWA Coyote Spring groundwater rights**
- **Cooperative participation in construction and operation of pipeline and facilities**
- **Enhanced regional water resource management**

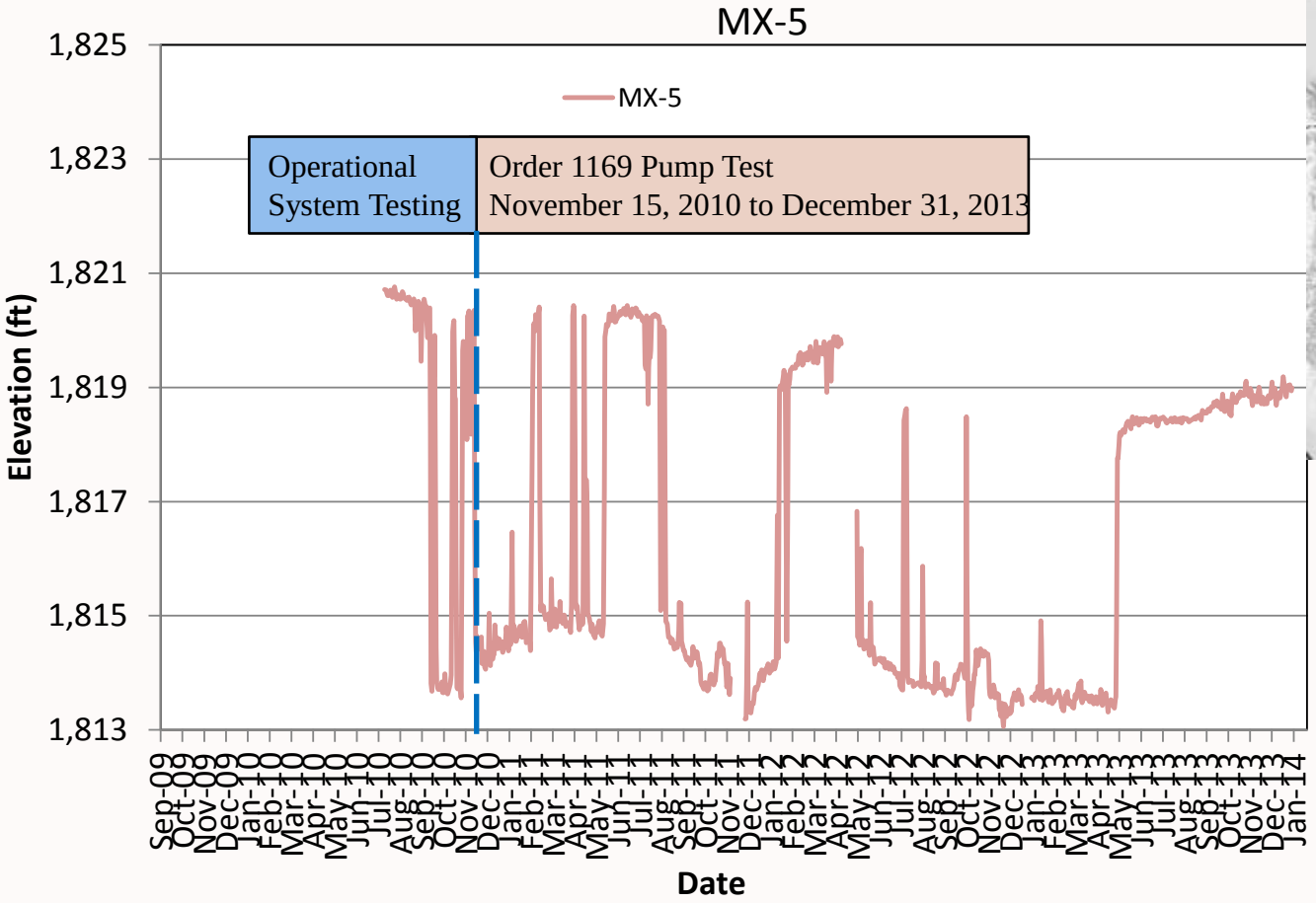


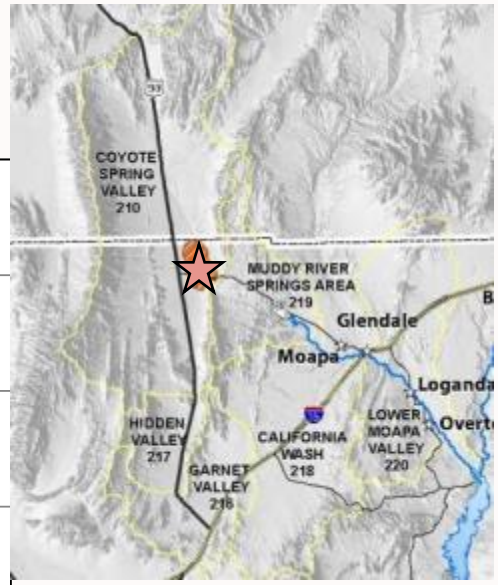

MX-5 Well
340 A Pipeline
MVWD Storage Tank
Existing MVWD Pipe
Gubler Crossing Discharge
SNWA / USGS Lewis Ave Gage
Coyote Spring Valley
Warm Springs Natural Area
Muddy River
Moapa - Paiute Reservation
Bowman Reservoir
Logandale
Virgin River
Lake Mead
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2014
0
2.5
5
10
Miles

Coyote Spring Valley Pumpage

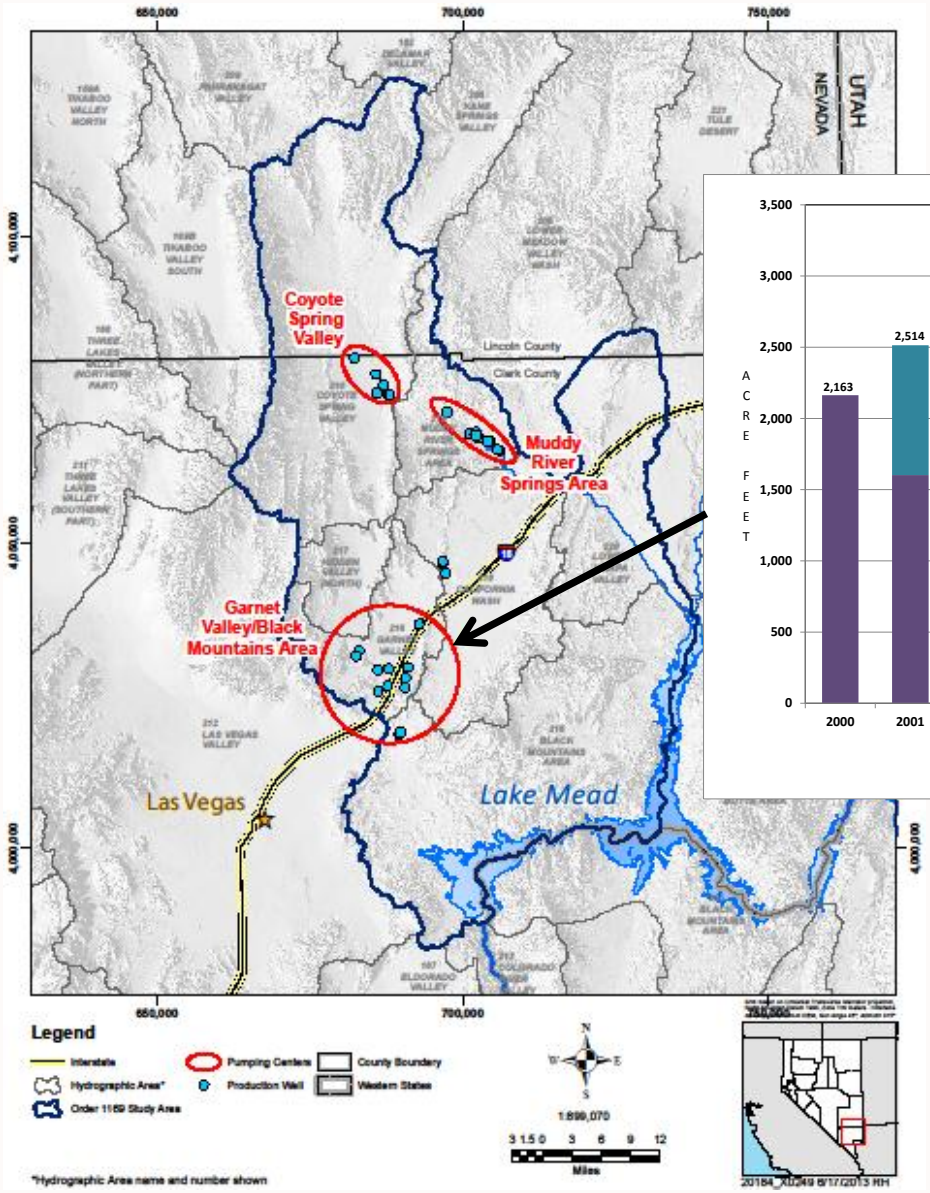


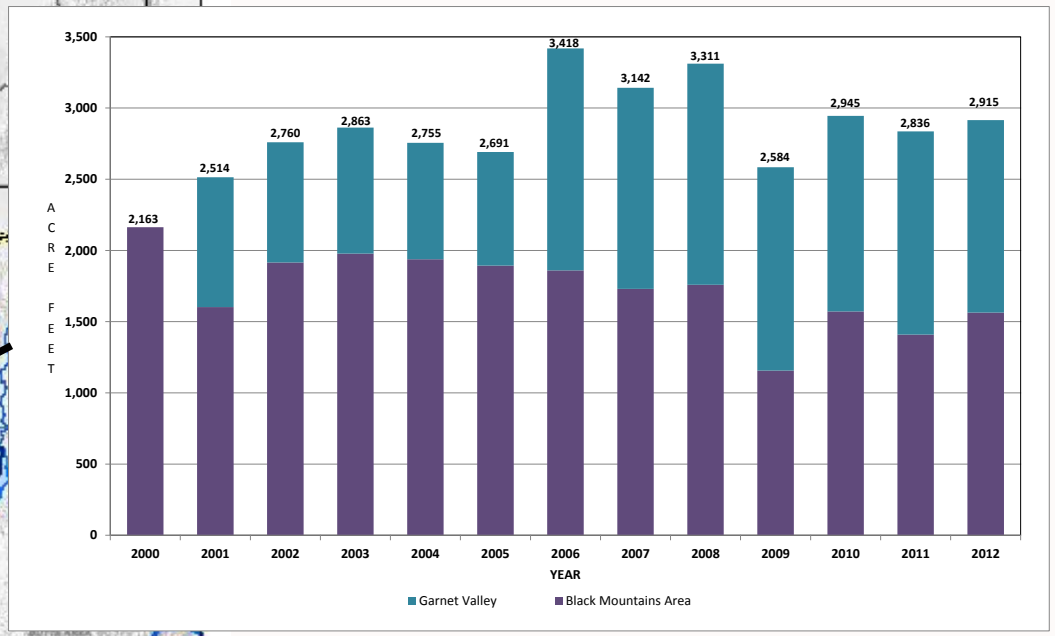
MX-5 Pumping


MX-5
MX-5
Operational System Testing
Order 1169 Pump Test
November 15, 2010 to December 31, 2013
Elevation (ft)
1,825
1,823
1,821
1,819
1,817
1,815
1,813
Sep-09
Oct-09
Nov-09
Dec-09
Jan-10
Feb-10
Mar-10
Apr-10
May-10
Jun-10
Jul-10
Aug-10
Sep-10
Oct-10
Nov-10
Dec-10
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
Jan-12
Feb-12
Mar-12
Apr-12
May-12
Jun-12
Jul-12
Aug-12
Sep-12
Oct-12
Nov-12
Dec-12
Jan-13
Feb-13
Mar-13
Apr-13
May-13
Jun-13
Jul-13
Aug-13
Sep-13
Oct-13
Nov-13
Dec-13
Jan-14
Date

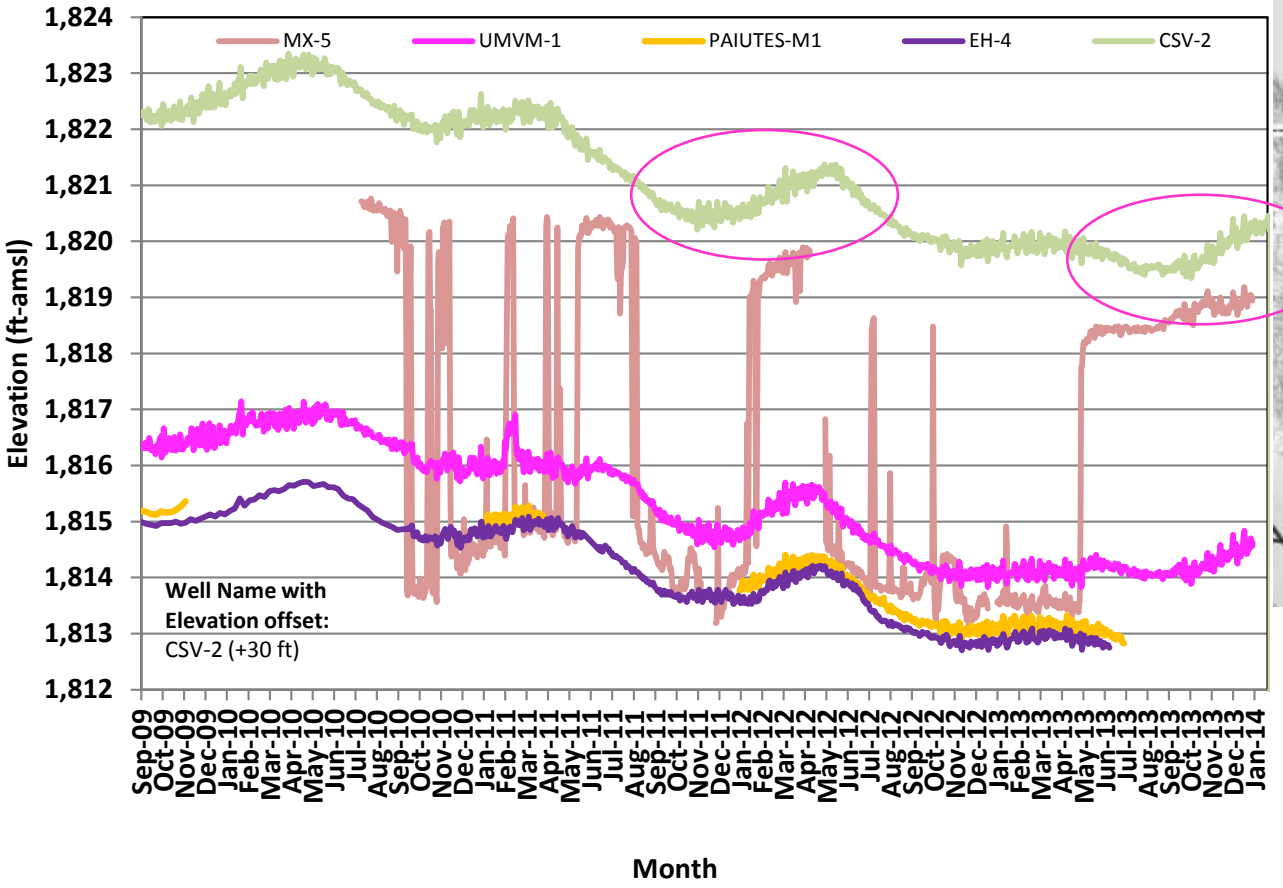

COYOTE SPRING VALLEY 210
MUDDY RIVER SPRINGS AREA 219
Glendale
Moapa
HIDDEN VALLEY 217
GARNET VALLEY 216
CALIFORNIA WASH 218
LOWER MOAPA VALLEY 220

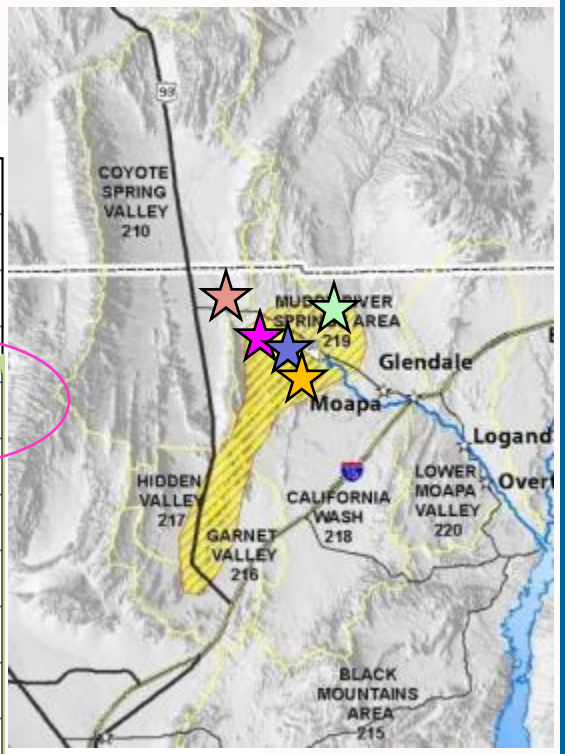
Additional Pumping Stresses



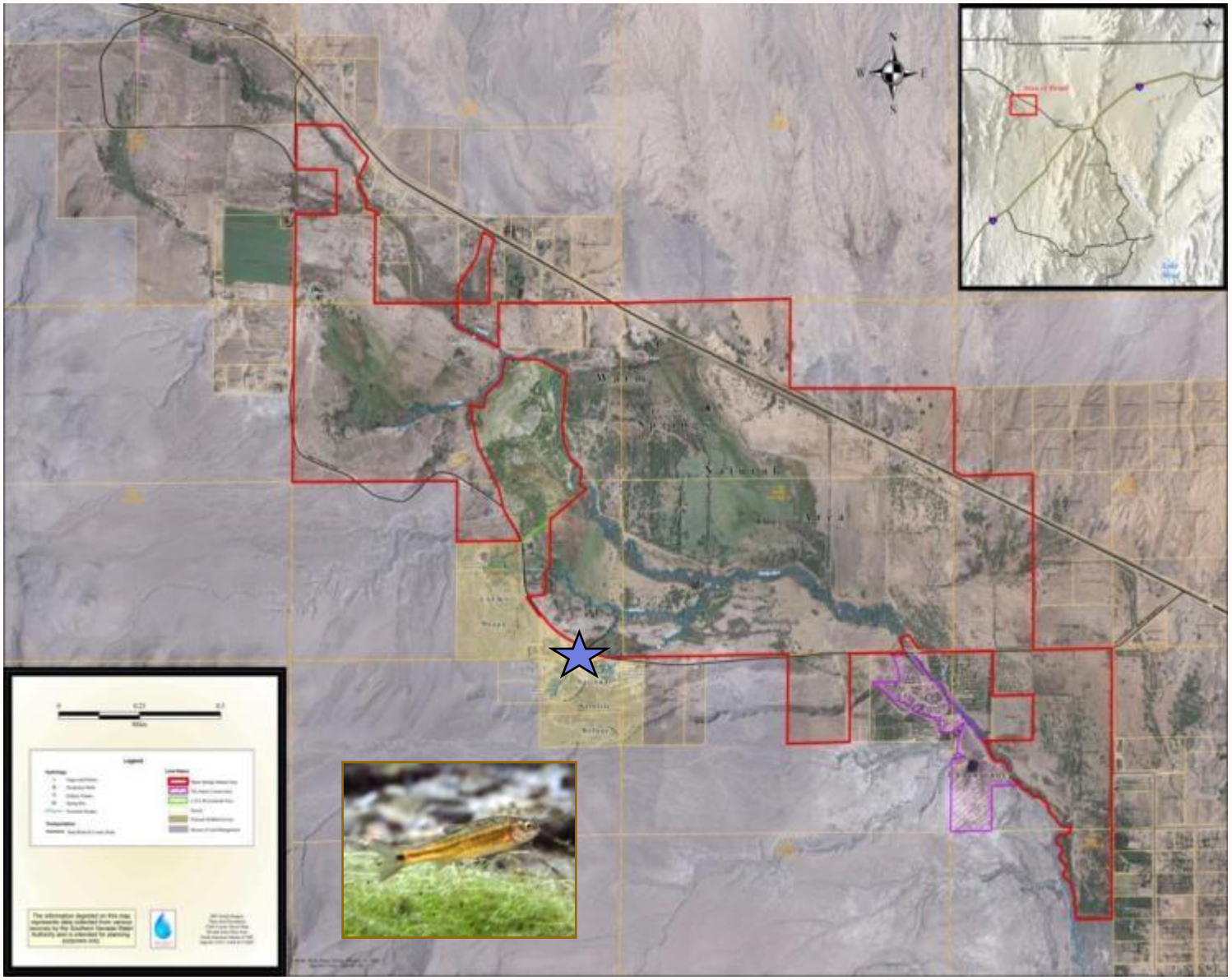


Water Levels Outside of Coyote Spring Valley - Eastern

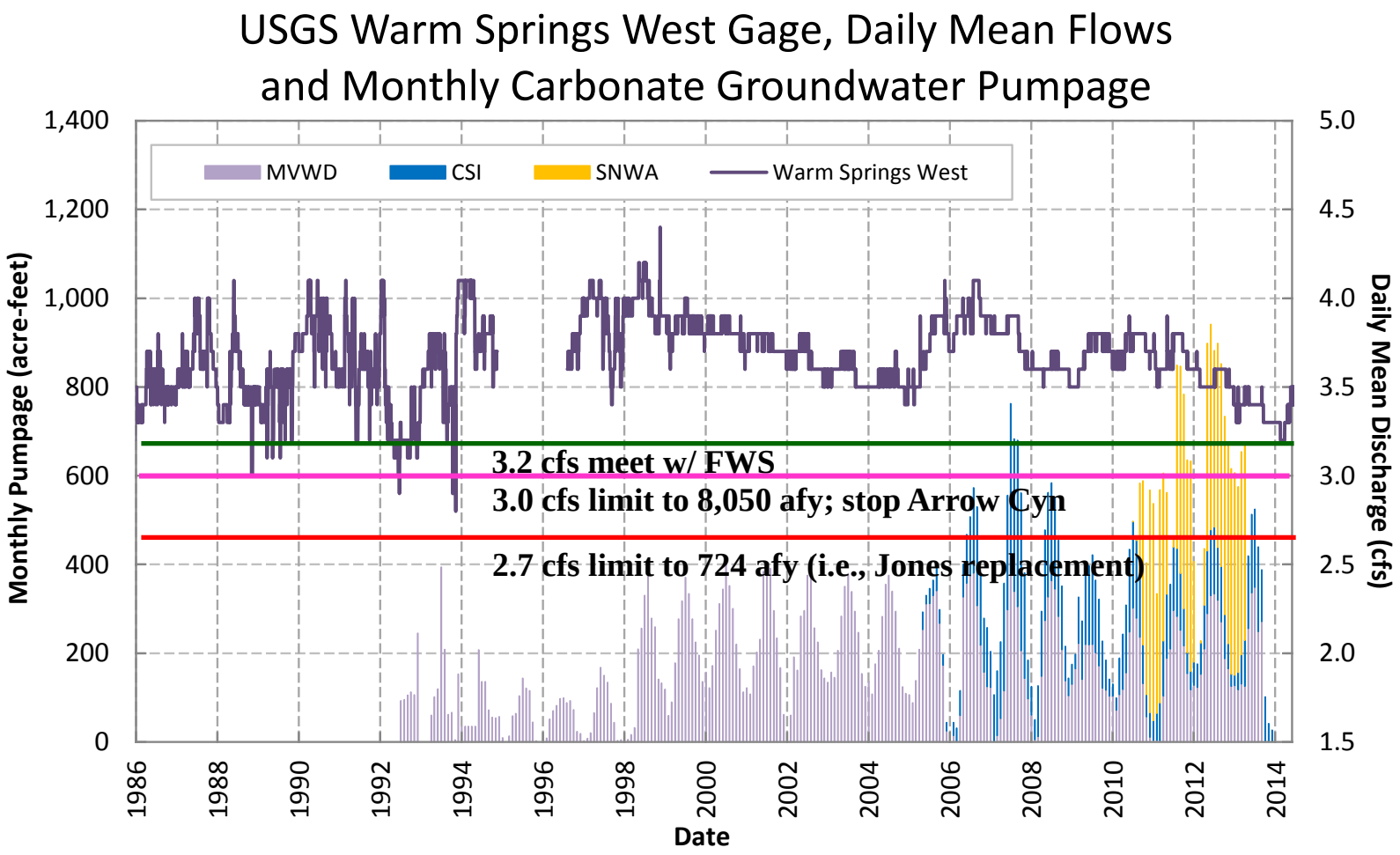




Muddy River Springs Observations

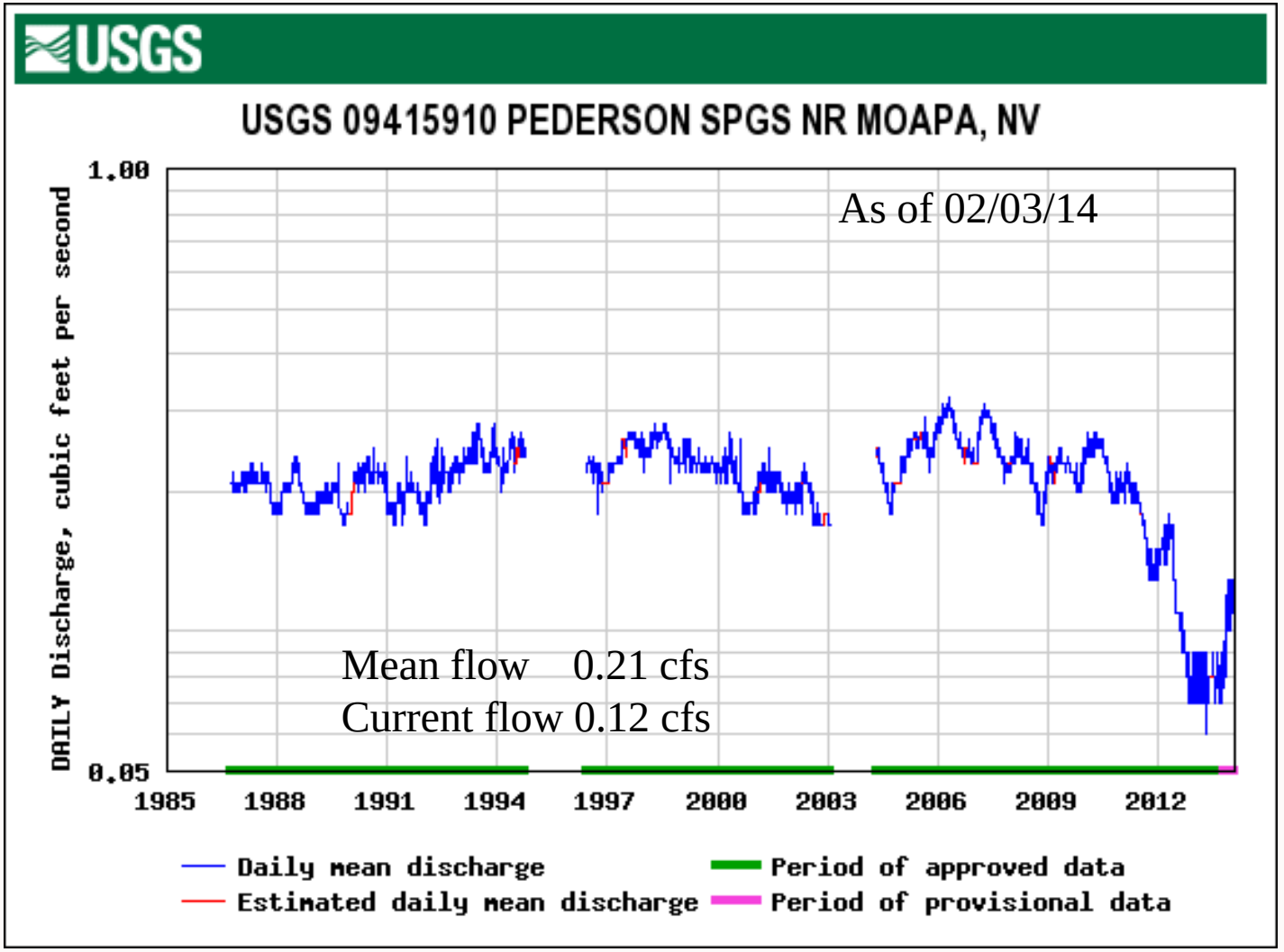


Stream flow and Triggers

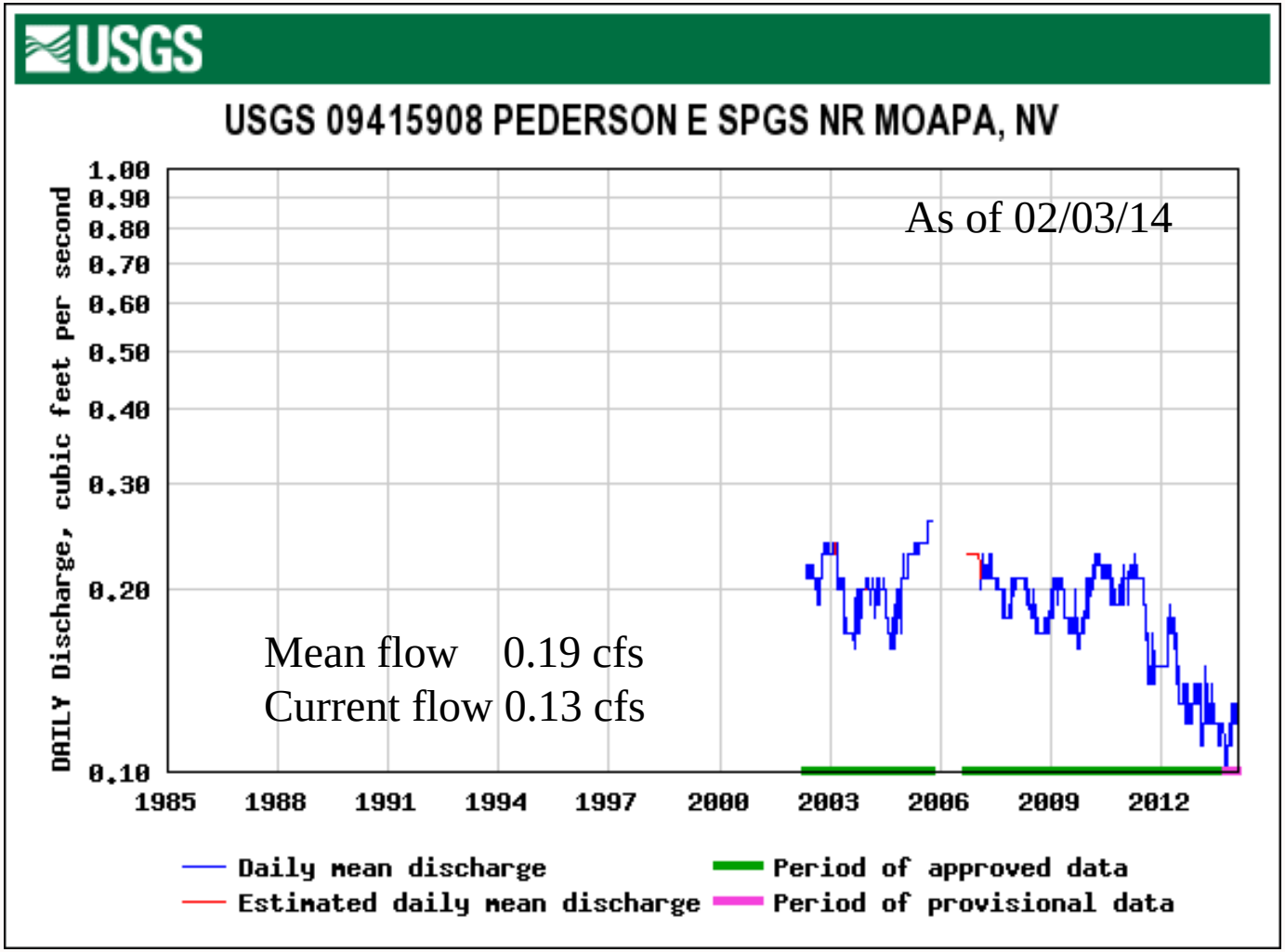


*Note: USGS daily mean flows are provisional for October 2013 thru February 2, 2014.
CSI and SNWA pumpage data through December 2013, MVWD through September 2013.

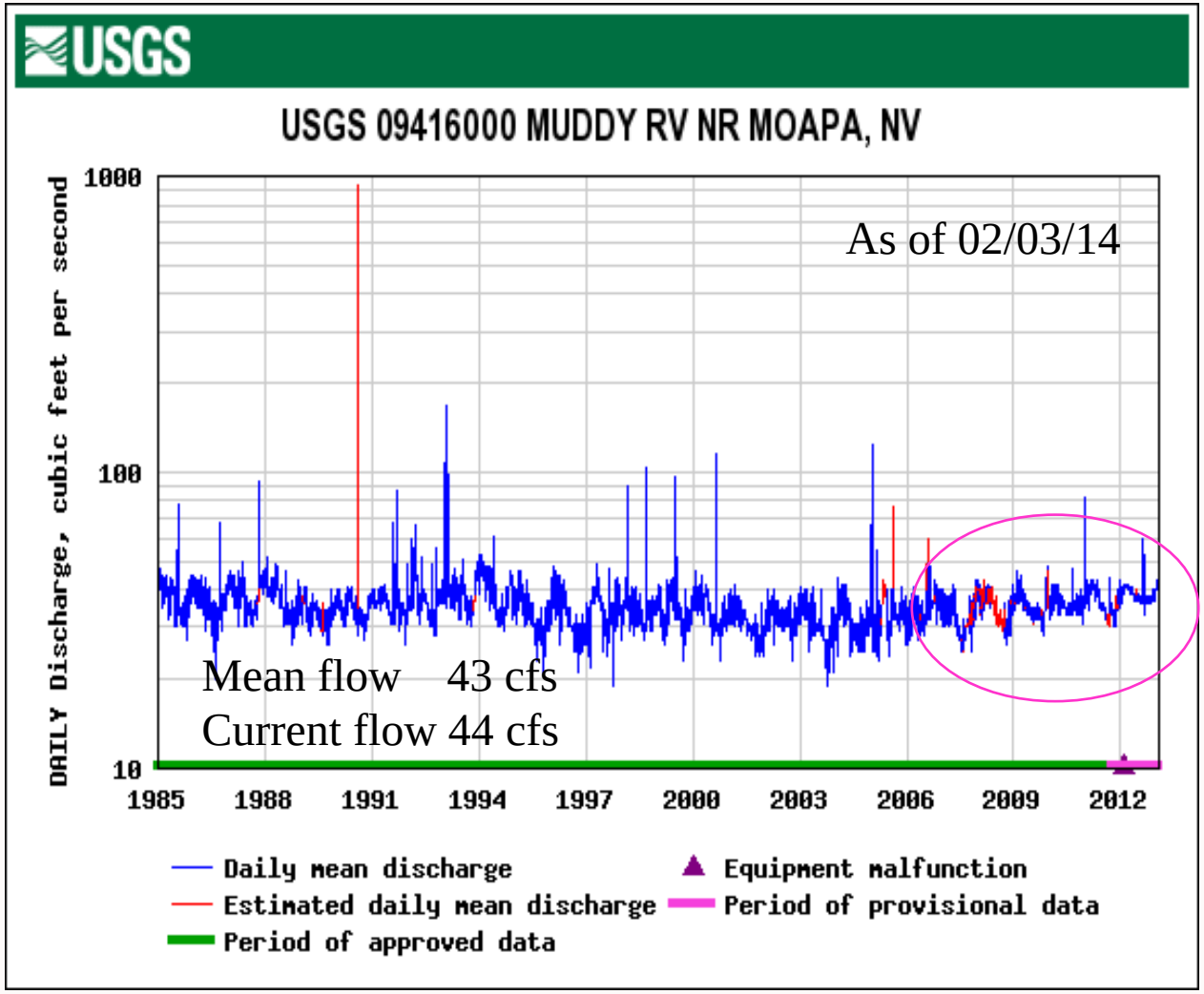
Pederson Spring Experiencing Probable MX-5 Drawdown Affects



Pederson Spring East Experiencing Probable MX-5 Drawdown Affects



Moapa Gage


USGS
USGS 09416000 MUDDY RV NR MOAPA, NV
DAILY Discharge, cubic feet per second
1000
100
10
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
As of 02/03/14
Mean flow 43 cfs
Current flow 44 cfs
Daily mean discharge
Estimated daily mean discharge
Period of approved data
Equipment malfunction
Period of provisional data

Observations

- GW level trends driven by 3 pumping centers and conditions preceding and during the test
- Reasonable GW lowering, recovery when pumping stopped
- Lack of response north of Kane Springs fault
- Declines in highest elevation springs anticipated, magnitude of decline minimal compared to Muddy River flow
- No discernible effects to flows at Moapa gage
- Local alluvial pumpage is the primary stressor to Muddy River flows

Observations

- **Ability to manage existing rights**
- **SNWA owns and controls more than 50% of the surface water rights on the Muddy River**
- **Pipeline and facilities enhance regional water resource management**
- **Environmental conservation programs effective**


COYOTE ‘SPRING’